Place new water lines into service after approval of all testing and flushing and authorization by the Engineer.

1510-4 MEASUREMENT AND PAYMENT

Water lines of the various sizes will be measured from end to end in place with no deduction for length through valves or other fixtures and paid by the horizontal linear foot. Water lines smaller than 2" and branch lines or service lines to fire hydrants, water meters and backflow prevention assembly will not be measured or paid.

If the contract does not include such pay items, measurement will not be made and the work will be incidental to other contract pay items.

Payment will be made under:

Pay Item	Pay Unit
__" Water Line	Linear Foot

SECTION 1515
UTILITY CONTROLS

1515-1 DESCRIPTION

Provide appropriate control devices, valves, meters, backflow prevention assembly and hydrants on water lines and force main sewers.

1515-2 MATERIALS

Refer to Division 10.

Item	Section
Sanitary Sewer	1034
Water	1036

Deliver only approved materials to the project.

Air release valves shall meet AWWA C512. In addition, air release valves for sanitary sewer force mains shall have long bodies, shall be equipped with back flushing connections and shall have a hood over the outlet.

Double check valves (DCV) backflow prevention assembly shall meet AWWA C510. Reduced pressure principle (RPZ) backflow prevention assembly shall meet AWWA C511.

Line stops consist of a sleeve, temporary valve and closure cap. The sleeve and cap shall meet applicable AWWA standards, shall be made of cast iron or stainless steel, shall be pressure rated at 200 psi and shall be sized for the type pipe to be tapped. The temporary valve shall be suitable for contact with potable water with NSF certification and designed to match the actual field conditions.

Line stop bypass pipe shall be pressure rated at 200 psi, shall be NSF certified and shall be adequately restrained.

Use screw or slip type valve boxes with a base to fit the valve yoke and a removable plug cap with the word “Water” or “Sewer” cast therein.

Precast manholes in accordance with Section 1525.

1515-3 CONSTRUCTION METHODS

Apply Section 1505 for excavation, trenching, pipe laying and backfill.

Place two 4" x 8" x 16" concrete blocks beneath valves and fire hydrants for support.

When necessary, due to project staging, install valves, meters and fire hydrants as appropriate for the current grade and make adjustments to finished grade as work progresses.

Provide enclosures with positive drainage for utility controls.

(A) Valves

Install all valves with an approved valve box set flush with the ground or pavement. Place a 24" diameter precast concrete ring flush with the ground around all valve boxes not in pavement.

Test and sterilize tapping valves before making the tap. Do not allow cuttings to enter the tapped main.

(B) Meters

Install water meters adjacent to the right of way or as shown in the plans.

Place meter boxes with the top of the meter box flush with finished grade of the project.

(C) Backflow Prevention Assembly

Install backflow prevention assembly off the highway right of way or as shown in the plans.

Licensed installers shall test and certify RPZ backflow preventor installations. Enclose RPZ backflow prevention assembly above grade in a hot box.

Enclose DCV backflow prevention assembly below grade in a precast concrete vault with positive drainage or above grade in a hot box.

Install the hot box on a 4" thick concrete slab that is 6" larger than the box and 2" to 4" above finished grade.

(D) Fire Hydrants

Install fire hydrants outside of the vehicle recovery area of the roadway, adjacent to the right-of-way line or in protected areas.

Connect fire hydrants to the main with a 6" valve and branch line having at least as much cover as the distribution main. Set hydrants plumb with the pumper nozzle facing the roadway and with the breakaway safety flange between 1" and 4" above the finished surrounding grade. Except where otherwise approved, place hydrants into service as soon as practicable. Place at least 7 cf of clean crushed stone around the base of the hydrant to insure drainage of the hydrant barrel.

Where necessary, remove the hydrant shoe and replace with the appropriate type to connect a relocated hydrant to the new pipe. Furnish and install or remove hydrant extension pieces to provide the proper bury of the pipe and hydrant.

(E) Line Stops

Provide line stop valves to temporarily shut down the flow in pressurized pipes. Provide line stops to temporarily dead end a pipeline when there are no available working valves on the existing piping. Provide line stops with bypass to isolate a section of the existing pipeline while maintaining the flow.

After line stop valves are removed, permanently cap the tapping sleeve and backfill the entire excavation with compacted select material.

(F) Air Release Valves

Install air release valves at the high point of pressurized pipelines. Place a precast manhole around air release valves.

(G) Miscellaneous Controls

Install corporation stops with tapping saddles for connecting 2" or smaller water lines to larger water lines. Install corporation stops at 45 ± 10 degrees from vertical on the larger line.

To aid in testing and flushing, install corporation stops at all elevated points along the pipeline to bleed off all entrapped air.

1515-4 MEASUREMENT AND PAYMENT

Valves, Water Meters, Fire Hydrants, Line Stops and other items listed in the pay items will be measured and paid per each for the appropriate size and type. Valves and other items on hydrant legs or service lines will not be measured or paid.

The term *Relocate* in a pay item means to physically move the existing item, either vertically or horizontally, using the appropriate materials to place the item into working order. Measurement and payment will be made per each for the appropriate size and type.

No additional compensation will be made for adjustments due to project staging on new or relocated items.

Reconnect Water Meter means to transfer or replace the piping from a new water line to an existing water meter that is not relocated. Measurement and payment will be made per each.

Valve boxes, meter boxes, hot boxes, vaults and manholes for protecting and servicing utility controls are incidental to the appropriate pay item.

A line stop with bypass consists of installing line stops on opposite ends of the piping to be isolated, tapping the piping beyond the line stops and providing temporary bypass piping between the taps. The entire assembly of valves and piping will be measured as one unit and paid per each.

Corporation stops or other items to aid in testing and flushing of the piping are incidental items.

If the contract does not include such pay items, measurement will not be done and the items will be incidental to other contract pay items. All piping, fittings, controls, certifications, appurtenances and other miscellaneous items necessary to place the new or relocated item in proper working condition are incidental.

Payment will be made under:

Pay Item	Pay Unit
__" Valve	Each
__" Tapping Valve	Each
__" Air release Valve	Each
__" Blow Off	Each
__" Water Meter	Each
Relocate Water Meter	Each
Reconnect Water Meter	Each
__" DCV Backflow Prevention Assembly	Each
Relocate __" DCV Backflow Prevention Assembly	Each
__" RPZ Backflow Prevention Assembly	Each
Relocate __" RPZ Backflow Prevention Assembly	Each
Fire Hydrant	Each
Relocate Fire Hydrant	Each
__" Line Stop	Each
__" Line Stop with Bypass	Each